

ABSTRACT OF THE DISCLOSURE

A thermoacoustic cooling system for cooling an object such as a microelectronic chip. Heat produced by the object is transferred to a thermoacoustic engine. The thermoacoustic engine may include a resonator defining a chamber. A stack may be positioned in the chamber with one side of the stack adjacent to the heat source, and the opposite side of the stack adjacent to air in the chamber having a relatively cooler temperature. One or more orifices may be formed in the resonator such that the acoustic power generated by the thermoacoustic engine creates a synthetic jet to circulate air and move the air away from the object being cooled. Thus, the heat produced by the object is used to power the thermoacoustic engine to thereby remove heat from the object. The thermoacoustic engine may use no moving parts and may require no external power source other than the object being cooled.

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